

Appln. No.: 10/781,610  
Amendment Dated November 14, 2005  
Reply to Office Action of June 13, 2005

GRY-119US

**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figure 1. This sheet replaces the original sheet.

Attachment

**Remarks/Arguments:**

By this amendment, claims 3, 5, 6 and 8 are amended and new claims 9-11 are added. No new matter is introduced by the amended or new claims.

**Amendment to the Drawings**

The Examiner objected to Fig. 1 as requiring a legend such as --Prior Art-- because only that which is old is illustrated. Fig. 1 is amended as suggested by the Examiner. Applicants respectfully request that this objection be withdrawn.

**Allowable Subject Matter**

The Examiner objected to claims 3-5 as being dependent on rejected base claims, but indicated that such claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim. Claims 3 and 5 have been amended into independent form including all of the limitations of the respective base claims and any intervening claims. Claim 4 and new claim 9 depend from claim 3 and new claim 10 depends from claim 5. It is respectfully submitted that claims 3-5, 9 and 10 are in condition for allowance.

**Claim Rejections Under 35 U.S.C. §102 and 35 U.S.C. §103**

The Examiner rejected claims 1, 2 and 8 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,188,336 (Graner '336). The Examiner rejected claims 1, 6 and 7 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,161,779 (Graner '779). The Examiner rejected claim 2 under 35 U.S.C. §103(a) as being obvious based on Graner '779 in view of U.S. Patent No. 4,883,025 (Richeson, Jr.). Applicants respectfully traverse these rejections.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. §2131 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143.

Independent claim 1 recites an electromechanical valve control actuator for internal combustion engines "wherein the electromagnet comprises a E-shaped magnetic circuit, and the magnet is located at the end of a branch of the E-shaped circuit." Applicants respectfully submit that neither Graner '336 or Graner '779 teaches or suggests an electromagnet comprising an E-shaped magnetic circuit, but instead, each teaches an electromagnet with a closing part to form a figure-8 shaped circuit. Each of these closing parts, ring 21 in Graner '336 and land 27 in Graner '779 as explained in detail below, makes the electromagnet larger so that there is a loss of flux in this element when the electromagnet generates a magnetic field. This is in opposite to the aim of the current invention to increase the flux density going through the plate as explained in paragraphs 49-53 of the specification.

Graner '336 explains at column 2, lines 2-6, "[t]he magnet circuit of this electromagnet is closed by the ferromagnetic parts of the tube 3, a cover plate 4 and an outward axially extending jacket 5. An outer pole 3' extends radially from said pole 3 to magnetically connect said inner pole 3 with said jacket 5." It is further explained at column 2, lines 60-63 that "a ring 21 of ferromagnetic material that then practically short-circuits one portion of the jacket 5 and tube 3 in the vicinity of the armature 2." This complete loop circuit is specifically claimed in Graner '336 claim 1 wherein it states at column 4, lines 44-48, "a ring (21) of ferromagnetic material in the magnet circuit of the electromagnet, said ring (21) is associated with the permanent magnet (1) and magnetically connects said jacket (5) with said inner and outer poles. . . ." Graner '336 fails to teach or suggest an electromagnet comprising an E-shaped magnetic circuit.

Graner '779 explains at column 4, lines 22-33, and illustrates in Fig. 2, "[t]he electromagnet 20 in a known manner has an exciter coil 38, which annularly surrounds a magnet core 24 forming a magnet pole 22 with a pole face 23 and is in turn surrounded by a magnet housing 25. The magnet housing is connected on one end via a short-circuit yoke 26 to the face end of the magnet core 24 remote from the pole face 23 and on the other end, via an annular land 27 near the pole face 23, to the magnet core 24. The magnet core 24, magnet housing 25, short-circuit yoke 26 and annular land 27 consist of the same ferromagnetic

material." Graner '779 also fails to teach or suggest an electromagnet comprising an E-shaped magnetic circuit.

Richeson, Jr. is cited only as teaching a valve rod (27) connected to the moveable plate. Richeson, Jr. does not overcome the shortcomings of Graner '336 and Graner '779. It is respectfully submitted that none of the cited references, alone or in any reasonable combination, teaches or suggests the claimed and that claim 1 is in condition for allowance. Claims 2 and 6-8 are dependent from claim 1 and therefore should also be allowed at least as dependent upon their allowable base claim. Applicants therefore respectfully request reconsideration and allowance of claims 1, 2 and 6-8.

New independent claim 11 recites an electromechanical valve control actuator for internal combustion engines "wherein the electromagnet comprises a E-shaped magnetic circuit, and the magnet is located at the end of a branch of the E-shaped circuit" and therefore should be allowable for the reasons set forth above with respect to claim 1. New claim 11 further recites " wherein a magnetic circuit formed by a central branch, an end branch of the E-shaped magnetic circuit, and a junction between this central branch and this end branch is open when the electromagnet does not generate a magnetic field."


As explained above, both Graner '336 or Graner '779 teach a closed configuration, not an open E-shaped configuration as required by claim 1. The ferromagnetic ring 21 of Graner '336 magnetically connects the jacket 5 with said inner and outer poles 3, 3', respectively. In Graner '779, "[t]he magnet housing is connected on one end via a short-circuit yoke 26 to the face end of the magnet core 24 remote from the pole face 23 and on the other end, via an annular land 27 near the pole face 23, to the magnet core 24." In each of these devices, the flux of the magnetic field created by the permanent magnet goes through these closing parts of the electromagnet even when the electromagnet does not generate a magnetic field. (see Graner '336, Fig.2, circuit I and II, col. 2, ln. 58 - col. 3, ln. 8; and Graner '779 Fig. 2, col. 5, lns. 3-16). The flux through each of these closing parts is specifically utilized in computing and controlling the attracting forces in the actuator, and therefore, there would be no suggestion or motivation to remove these closing parts. None of the cited references, alone or in any reasonable combination, teaches or suggests an E-shaped electromagnet circuit wherein a magnetic circuit formed by a central branch, an end branch of the E-shaped magnetic circuit, and a junction between this central branch and this end branch is open when the electromagnet

does not generate a magnetic field. Applicants therefore respectfully request consideration and allowance of claim 11.

It is respectfully submitted that each of the pending claims is in condition for allowance. Early reconsideration and allowance of each of the pending claims are respectfully requested.

If the Examiner believes an interview, either personal or telephonic, will advance the prosecution of this matter, it is respectfully requested that the Examiner get in contact with the undersigned to arrange the same.

Respectfully submitted,

  
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Attachments: Figures 1-2 (1 sheet)

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Denise R. Marshall